

Presenting Lexical Bundles for Explicit Noticing with Schematic Linguistic Representation

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Abstract

Lexical bundles are essential for fluency, but their incompleteness is a stumbling block for learners. In this study, two presentation methods to increase awareness of lexical bundles through explicit noticing are explored and compared with incidental exposure. The three conditions in this study were as follows: noticing with schematic linguistic representation ($n = 15$), noticing with context completion ($n = 26$) and meaning focused exposure ($n = 24$). Participants were English language learners at a university in Japan. Following treatments, the ability to produce lexical bundles in written English was measured. Immediate learning gains were significantly greater for the schematic linguistic representation method; however, no significant difference in gains between the conditions appeared in the two week delayed post-test. Results suggest that while noticing lexical bundles with schematic linguistic representation is an effective initial learning intervention, this is no guarantee for long-term knowledge retention.

Keywords: lexical bundles, formulaic language, multi-word units, explicit noticing, linguistic labelling, first language translation, word strings, incomplete lexical bundles, schematic linguistic representation, attention.

Introduction

Language can be described as formulaic in essence (Pawley & Syder, 1983; Wray, 2002); indeed, a lot of the phrases and expressions we use to communicate are not original, but rather common, and can be anticipated within their context. Research suggests that formulaic language is stored and processed holistically (Jiang & Nekrasova, 2007; Wray, 2002); therefore, formulaic language can be described as a short cut for speedy processing. It allows speakers and writers to communicate their message faster, and with less effort; likewise, it allows listeners and readers to process a received message, at faster rates, and with less effort than if they were to process a message word for word. It is no surprise then that the use of formulaic language correlates with fluency; studies have shown that when second language speakers use formulaic language, they come across

with greater fluency or proficiency (Boers et al., 2006; Wood, 2007). Therefore, creating learning opportunities for developing knowledge of formulaic language is of interest to both language learners and teachers.

However, to date, pedagogically orientated studies on formulaic language learning have mostly dealt with collocations and idioms. Lexical bundles, a term coined by Biber et al. (1999), refers to the highest frequency word strings in corpora (p. 183); they constitute an important and under-investigated type of formulaic language. A word string that can be identified as a lexical bundle is one which occurs 10-40 times upwards per million words, in sub-corpora of a single register, over a range of different texts (c.f. Biber & Conrad, 1999, p. 184; Biber, Conrad, & Cortes, 2004, p. 376; Biber, Conrad, & Leech, 2002, p. 444; Hyland, 2008; Simpson-Vlach & Ellis, 2010, p. 492). These are different from collocations because lexical bundles combine function words (on, the, to etc.) with content words. For example, *the way in which*, *as a result of his*, and *by the end of the* are all examples of lexical bundles. In contrast, collocations are content words, which have a high likelihood of occurring together (e.g., *stray dog*), but their appearance is not as frequent as the lexical bundle in a corpus (c.f. Biber, 2009, p. 288).

The inclusion of function words in lexical bundles means that they are made up of highly frequent and familiar words. Combined with their transparent and incomplete appearance, lexical bundles can be expected to escape learner attention. Since attention is argued to be essential for learning, the question arises as to whether it would be useful or effective to deliberately draw learner attention to lexical bundles. Following a review of the literature, I will present a study where two different noticing methods were juxtaposed against a non-noticing method in order to empirically test the efficacy of the noticing interventions for learning lexical bundles.

Can lexical bundles be acquired incidentally?

Lexical bundles are an essential part of fluent language production. Accordingly, the question arises as to whether learners need to notice them explicitly in order to learn them or whether they can be acquired incidentally. Crossley & Salsbury (2011), in their longitudinal study of the accurate production of two-word lexical bundles by language learners over the course of a year, found that accuracy of two-word lexical bundles increased (e.g., *I think, what is, and we*). In their study, learners were in an intensive English program in the USA, and the authors did not mention any explicit instruction on bigram lexical bundles. This suggests that by simply increasing language exposure, accuracy in the production of bigram lexical bundles will develop.

In another study by Stengers, Boers, Housen, & Eyckmans (2010), teacher-led noticing of chunks (a broad term which encompassed most types of formulaic language), was compared with non-noticing over an eight-month period. Results showed no difference in the chunk knowledge between the two conditions. Accordingly, this begs the question of whether there may be no need for learners to explicitly notice the more narrowly defined lexical bundles.

The incompleteness of lexical bundles

One of the concerns researchers raise about the learnability of lexical bundles is that they often appear incomplete, which reduces their salience to learners. In a corpus study that

produced a short list of 21 academic lexical bundles, Byrd and Coxhead (2010) observed that while some lexical bundles appeared to be complete, others appeared incomplete and required the user to complete them for each specific use. For example, adding *basis* to *on the basis of* completes the bundle (Byrd & Coxhead, 2010, p. 45). They suggested that the longer lexical bundles that appear incomplete (e.g., *as well as the*) could be taught as a sub-type of the more frequent, and shorter, lexical bundles found within the longer one (e.g., *as well as*) (see Byrd and Coxhead, 2010, p. 45).

Simpson-Vlach and Ellis (2010), in their investigation of the most frequent lexical sequences in academic corpora (referred to as academic formulas), also noted that some highly frequent lexical sequences lacked completeness. Furthermore, consulting a number of experienced language teachers, the authors found that these teachers considered certain lexical sequences to be neither psychologically salient nor pedagogically relevant. An example of such a sequence is *and of the*. Drawing from this teacher intuition, Simpson-Vlach and Ellis developed a mixed measure to determine whether a frequent academic formula was worth teaching. The authors also published a list of academic formulae based on this mixed measure. However, despite reducing incomplete formulas in their list, an independent assessment of Simpson-Vlach and Ellis's list by Liu (2012, p. 27) observed that 18% of formulas still ended in *a/the*.

Liu (2012) also noted that multi-word constructions ending in *a/the* did not stand out to the reader, as they appeared structurally and semantically incomplete. He suggested that partial filling, where only some of the lexical elements are filled while others are replaced by schematic linguistic representation, would allow all multi-word constructions to be presented as structurally complete. An example would include changing "*this is the* to *this is (determiner + noun phrase)...*" (Liu, 2012, p. 27). Of course, this presentation method extends the lexical bundle from the core unit, to include the words or types of words that often follow. It is yet to be shown whether or not this is a pedagogically effective presentation method for lexical bundles.

Increasing the salience of lexical bundles

Textual enhancement (e.g., highlighting, bolding, underlining) could be used to increase the salience of lexical bundles in texts. Textual enhancement has been found to be effective for increasing later use of highlighted verb forms in the case of Spanish language learners (Jourdenais, Ota, Stauffer, Boyson, & Doughty, 1995). However, there is no research to date that has tested the effectiveness of textual enhancement specifically for lexical bundles.

A study by Boers et al. (2006), however, suggests that increasing the salience of lexical bundles could potentially be achieved by having learners underline them when they appear in reading and listening texts. The authors conducted a study where learners were encouraged to underline collocations in reading and listening texts, thereby increasing the salience of the collocation. While not focusing on lexical bundles per se, an experimental group of learners underlined formulaic sequences (standardized phrases such as collocations and idiomatic expressions) within classroom texts, with assistance from the teacher. The comparison group learned from the same texts, using traditional grammar-and-lexis teaching. At the end of the 22-hour course, all participants were

interviewed by two judges blind to the conditions. Results showed that participants from the experimental group came across as more proficient than those from the comparison group. When the interview transcripts were analysed further, the experimental group members were found to use more formulaic sequences in their speaking. Hence, the noticing through underlining method was shown to increase the use of formulaic sequences. The results suggest that drawing learner attention to target items in a text may be effective for uptake.

Considering the crucial role that lexical bundles play in fluent expression and comprehension, and the fact that incomplete lexical bundles account for the majority of lexical bundles (Biber et al., 2002), it seems pertinent that methodologies for teaching and learning lexical bundles that overcome their lack of salience and incompleteness are developed and empirically tested. Indeed, teacher-led noticing of formulaic sequences through underlining has been shown previously to increase use (Boers et al., 2006), while teacher led noticing of chunks was found to be no more effective than non-noticing conditions (Stengers et al., 2010). The efficacy of teacher led noticing of lexical bundles however, is yet to be tested empirically. It would also be interesting to discover how lexical bundles are best presented to learners as complete units.

This paper will detail an empirical study which compared two noticing treatments with a non-noticing treatment. In the first noticing treatment, lexical bundles were presented in a list completed with context words. These lexical bundles had to be found and underlined within the treatment texts. In the second noticing treatment, lexical bundles were presented in a list completed with schematic linguistic representation, and had to be found, underlined, and labelled within the texts. In the non-noticing treatment, participants answered meaning focused questions based on the treatment texts. It is hoped that the results of this study will shed light on whether purposefully 'noticing' lexical bundles in texts is a useful learning intervention, worthy of the extra class time and effort it necessitates. Furthermore, if noticing is an effective method, which presentation format is more effective: context completed lexical bundles or schematically completed lexical bundles?

Research questions

1. Does explicit noticing of lexical bundles in a text result in greater productive knowledge of lexical bundles?
2. Are lexical bundles better presented for learning when they are context completed, or when they are completed using schematic linguistic representation?

Participants

The participants came from three intact second-year English classes at a private university in Japan. The participants shared Japanese as their first language and had all been through the Japanese high school system with mandatory English classes. They had also taken a first year general English course at the university. The three classes were not streamed, and proficiency levels were mixed. Therefore, as whole units, the classes were considered to be comparable on merit of their mixed constitution. Of the three classes, two classes became treatment groups, and the third class became a comparison group.

The treatments and testing took place during normal class hours, and participants were informed directly before the pre-test that the tests and activities were part of a research project into language teaching methods; this was done verbally in English. Explanation was also provided through a hand-out in Japanese, which explained that participation was optional, and opting out simply meant writing a *no* on their test sheet instead of their test number. A pre-test was used to detect participant knowledge of lexical bundles and remove any known items from the test pool. In this way, treatments and post-tests were carried out on unknown lexical bundles only.

There were 46 participants in the pre-test, which was considered a sufficient sample of the larger group, in order to remove certain lexical bundles from the testing pool. In total, 65 participants were present for the treatment and immediate post-test, and 59 were present for the delayed post-test two weeks later. Participation fluctuated due to absences and participation choice. All participants were assumed to start from an equal level of zero productive knowledge of the target lexical bundles, based on the pre-test that eliminated known items. As a double check that the pre-test results were representative of the entire group, analyses from only those who took part in the pre-test as well as the post-tests was also carried out, and is reported in the results section together with results from the wider group.

Target items

First, a collection of lexical bundles needed to be identified. Potential sources for lexical bundle selection that were considered included the most frequently used multi-word constructions in general academic written English (as created by Liu, 2012); frequency derived lexical bundles from spoken and written academic corpora (as created and categorised by Biber et al., 2004); and the most relevant formulaic sequences for teaching in academic speech and writing (as created by Simpson-Vlach and Ellis, 2010). Liu's list (2012) was chosen because it presented the lexical bundles complete with schematic linguistic representation, which was the presentation method to be tested in this study.

The multi word constructions in Liu's *band 1* list fit into the definition of lexical bundles because they were highly frequent, occurring 100 or more times per million words, they were transparent, and appeared structurally incomplete. A selection (30) were used to create a bilingual pre-test, which was piloted first on a small group of advanced adult learners, and later on in university classes with learning conditions similar to the participant groups.

The pilot pre-tests revealed that a 30-item test would take 20 minutes, which was considered too long for an in-class study. Therefore, the pre-test was reduced from 30 lexical bundles to 15, with a pre-test time of 10 minutes. Out of the 15 items in the pre-test, six items were removed because some participants demonstrated knowledge of them. After this removal, nine lexical bundles remained that participants showed no knowledge of. The remaining nine lexical bundles which were used in the treatments are listed below in table 1.

Table 1. Lexical Bundles Used in the Treatments

Lexical bundle completed with schematic linguistic representation	Lexical bundle completed with context words as in treatment texts
Each of (det + N)	Each of them
The way in which (det + N) + VP	The way in which she tricks
NP assume that (det + N + VP)	You might assume that she would never attack
As a result (of det + N)	As a result of her trickiness
Referred to (as) (det + N)	Referred to as “the trickster”
Depend on (det + N)	Depend on his work schedule
Due to (det + N)	Due to the fact
(in) the development of (det + N)	In the development of a local kindergarten
(in) the case of (det + N)	In the case of NZ

In the pre-test, the test-taker was presented with a Japanese sentence, which was a translation from the English. The English sentence was also given, but it had gaps for the words making up the target lexical bundle. Therefore, the test-taker would look to the Japanese for the intended meaning and then attempt to fill the gaps in the English sentence with the target lexical bundle. A gap was given for each word to help guide answers. Translation was used for the prompts because it was seen as an efficient and simple trigger to the target language. All translations were carried out by a native Japanese speaker and double checked by an independent English-Japanese bilingual. Example items showing the format of the pre-test can be seen below:

Table 2. Pre-test Examples

私は、あの鳥の飛び方が大好きなんです。	I love ____ bird flies.
Answer	I love <u>the way in which</u> <u>that</u> bird flies.

The concept of pre-testing and eliminating items known to participants was inspired by a similar design found in Laufer and Girsai (2008). In their study, the resulting ten target items were woven into purpose-made texts used in the treatments. In this study also, the nine lexical bundles that emerged as unknown to participants, through the pre-test, were woven into two purpose-made narrative texts. The texts were just under 100 words each and contained 90% high frequency words (1-2K); based on analysis using *Web Vocabprofile* (Cobb, 1994) adapted from Heatley and Nation’s (1994) *Range*. The texts not only provided the reading platform for the noticing activity, but also provided contextual clues to the meaning and use of the target lexical bundles. An L1 translation of the texts

was included below the English, along with translation of instructions, to increase understanding and noticing in the treatments.

Procedure

A week after the pre-test, the two texts were given to participants on a double-sided handout (i.e., one text on each side). In the two noticing conditions (noticing context completed lexical bundles and noticing with schematic linguistic representation), a list of lexical bundles was included below the reading text. In the comparison group, there were meaning focused questions below the texts, rather than a list of target items.

The way the lexical bundles were presented in the lists differed between the two noticing groups. In the context completed treatment, the lexical bundles were listed as completed, with the context words from the texts, for participants to locate, and underline within the text, for example: *as a result of her trickiness*. In the schematic linguistic representation treatment, the list had the core lexical bundles completed with schematic linguistic representation (e.g., *as a result of* [determiner + noun]). Using this list, participants needed to find and underline the lexical bundles in the text, and label the words which completed them, for example: *as a result of her*(det) *trickiness*(noun). L1 translations of the metalinguistic terminology with examples were given on the hand-out to facilitate comprehension. After finding the nine target lexical bundles, participants in both groups were told to compare their findings with a partner, and answer sheets were distributed so they could check their answers.

The third class used the same texts and were given four meaning focused questions (two for each text), to answer in small groups. Answers were then elicited and clarified by the teacher in a class discussion. No explicit attention was drawn to the target lexical bundles in this class. The treatments were limited to ten minutes in each condition and followed by a five-minute immediate post-test. Two weeks later, the same test was given unannounced as a delayed post-test in order to test the longevity of the effect of the treatments.

Post-tests and scoring

The sentences where the target lexical bundles occurred in the treatment texts were re-used in the post-tests. The post-tests included the same formatting as the pre-test with an English sentence in which participants had to write the target lexical bundle. A Japanese translation of the whole test sentence was also provided to help guide answers. The results were then statistically analysed.

Immediate post-tests and delayed post-tests were marked, taking into account partial knowledge of lexical bundles. Accordingly, each correct recognisable word, written in the appropriate gap, was given one point. There were 33 word gaps, or points, spread over nine lexical bundles. Scoring was done in this way to counterbalance the various lengths of the lexical bundles. A three-word lexical bundle would represent a lighter learning burden than a six-word lexical bundle, so giving one point per word, rather than one point per lexical bundle, provided the most balanced scoring method. Words that were written in the wrong order, or wrong numbered space, incorrect articles (a/the) written in the correct space for the article, and incomplete word-parts such as *develop* instead of the full word *development* were given half a point as they showed evidence of learning. We know

that language learning is incremental, and it takes many encounters with a word to eventually know it well enough to produce it. Therefore, refining the scoring system to be sensitive enough to show partial knowledge demonstrated in this productive test seemed wise, there is also precedent within lexical research (see for example Barcroft, 2002 for a similar approach to word knowledge).

Results

As the pre-test was used to eliminate all known items, it was assumed that all participants started from zero productive knowledge of the target lexical bundles. Table 3 below shows the descriptive statistics over all three conditions. The maximum score possible over the nine lexical bundles was thirty-three. The noticing with schematic linguistic representation condition scores had higher means (*M*) than the other conditions in both the immediate and the delayed post-tests.

Table 3. Results by Condition

Immediate post test					Delayed post test				
Condition	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Mdn.</i>		<i>N</i>	<i>M</i>	<i>SD</i>	<i>Mdn.</i>
Context	26	4.38	3.27	3		24	5.29	4.67	3.75
NSLR	15	7.63	4.36	6		14	6.39	5.46	6
MFI	24	4.67	4.10	4		21	4.55	4.87	2

Note. Context=Noticing context completed lexical bundles, NSLR=Noticing with schematic linguistic representation, MFI=Meaning focused instruction (non-noticing condition)

An ANOVA (with test scores as dependent factors, condition as the between-subject factor, and ω^2 as the measure of effect size), showed that there was a significant difference between the scores in the different conditions in the immediate post-test ($F(2,62) = 3.80, p < .05, \omega^2 = .09$), but not in the delayed post-test ($F(2,56) = 0.59, p > .05, \omega^2 = .01$). Bonferroni post-hoc tests on the immediate post-test clarified this difference, showing the noticing with schematic linguistic representation scores ($M = 7.63, SD = 4.36$) to be significantly higher than the scores from noticing context completed lexical bundles ($M = 4.38, SD = 3.27$) ($M_{diff} = 3.25, 95\% \text{ CI } [.17, 6.32], p < .05, d = .84$). Post-hoc tests also showed the difference between noticing with schematic linguistic representation scores ($M = 7.63, SD = 4.36$) and meaning-focused instruction scores ($M = 4.67, SD = 4.10$) to approach statistical significance with a large effect size ($M_{diff} = 2.97, 95\% \text{ CI } [-.15, 6.09], p > .05, d = .70$). Thus, the pattern that emerged was that those who had noticed the lexical bundles using schematic linguistic representation were able to demonstrate greater learning gains in immediate post-tests than those in both the context completed noticing condition, and those in the non-noticing condition. However, two weeks later when the delayed post-tests were administered, there was no significant difference in productive knowledge of the lexical bundles between participants across the three different conditions.

As mentioned above, not all participants took the pre-test. In order to check the trends shown by the overall data, a second analysis, which removed those who did not take the pre-test, was carried out. The descriptive statistics from this narrower sample can be found in Table 4 below.

Table 4. Results by Condition (Only Those Pre-tested)

Immediate post test					Delayed post test				
Condition	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Mdn.</i>		<i>N</i>	<i>M</i>	<i>SD</i>	<i>Mdn.</i>
Context	11	5.55	4.14	5		11	7.09	4.31	7
NSLR	12	7.5	4.65	6		11	6	4.80	6.5
MFI	16	5.38	4.44	4.25		11	6.09	5.76	3.5

When data from those who did not sit the pre-test was removed, the number of participants (*N*) dropped between 20-58%, contributing to reduced statistical significance. Despite this decrease, a similar pattern to the overall results was seen; that is noticing with schematic linguistic representation scores had a slightly higher mean ($M = 7.5, SD = 4.65$) than both noticing context completed lexical bundles ($M = 5.55, SD = 4.14$), and meaning-focused instruction ($M = 5.38, SD = 4.44$) in the immediate post-test. However, in contrast to the wider group results, the delayed post-test results showed the noticing context completed lexical bundles instruction condition actually having a higher mean ($M = 7.09, SD = 4.31$) than noticing with linguistic representation ($M = 6, SD = 4.80$) and meaning focused instruction ($M = 6.09, SD = 5.76$). It is peculiar that the mean score for the delayed post-test was higher than the original post-test mean score, in both the context completed group and the meaning focused group, suggesting some extra exposure or rehearsal may have occurred for some participants in these groups.

Unfortunately, there was no triangulating data collected to check on exposure to the target items between the immediate post-test and the delayed post-test. An ANOVA showed the differences between group means to be non-significant in the immediate post-test ($F(2,36) = .900, p > .05, \omega^2 = -0.01$), and likewise non-significant in the delayed post-test ($F(2,30) = .162, p > .05, \omega^2 = -0.05$). By removing those who did not do the pre-test, a reduction in group sizes is seen which of course makes statistically significant differences more difficult to detect. Although results from the immediate post-test of the wider group suggested greater learning occurred with the schematic linguistic representation group, this was not as strongly evident in the secondary analysis of the smaller group of participants.

Discussion

This study sought to discover whether deliberate noticing of lexical bundles within texts would result in greater uptake than simply reading the texts in order to answer meaning focused questions. It obviously takes more effort and time to deliberately notice lexical bundles, so this extra effort should be justified by evidence that it produces superior learning.

The immediate post-test results from the whole group (including those who did not take the pre-tests) showed that the noticing with schematic linguistic representation participants gained a higher average score than those who were in the noticing context completed lexical bundles condition. In the narrowed sample of only those who took the pre-test this trend was also seen, though not at a significant level. It is helpful to keep in mind that the treatments were only ten minutes in duration, and the target lexical bundles were unknown to participants at the beginning of this time. Additionally, uptake of the lexical bundles was only measured if it was demonstrated productively in writing. For a first meeting with an unknown language item, any learning gains that are evident in a productive test over such a short time span, which is always more difficult than receptive recognition, are noteworthy.

Therefore, giving learners an activity where they need to find and identify lexical bundles in a text, using a list of lexical bundles, completed with schematic linguistic representation, rather than a list of lexical bundles simply completed with the context words from the text, can be seen as one way to increase learner attention to lexical bundles. However, without follow-up exposure or use, initial learning gains can be expected to disappear as the memory trace fades. Indeed, this was shown in the two weeks delayed post-test. Thus, while noticing with schematic linguistic representation may be a good starting point for uptake, it needs to be followed up with further encounters with the lexical bundles.

This study shows that while noticing with schematic linguistic representation may be helpful for gaining initial knowledge of lexical bundles, as a solitary intervention it is insufficient for developing long-term productive knowledge of lexical bundles. Nonetheless, it does overcome the lack of salience inherent with lexical bundles by not only drawing learner attention to them, but also by engaging them in a critical appraisal of the words that complete them. The increased awareness and use of the schematic linguistic labels that can be assigned to the words that complete lexical bundles also provide the learner with a meta-linguistic way to check the accuracy of their own production of lexical bundles. While this was not tested in the current study, it is a logical prediction, and warrants further investigation in future studies.

Conclusion

In response to the first research question; this study suggests that brief explicit noticing of lexical bundles with schematic linguistic representation is more effective than incidental exposure for initial learning of lexical bundles. It is worthwhile to encourage explicit noticing of lexical bundles within texts, since directing extra attention to these formulaic sequences raises learner awareness, which was shown in the post-test result of this study. In response to the second research question, noticing lexical bundles with schematic linguistic representation seems to be more effective than noticing context completed lexical bundles, at least when uptake is measured immediately after the activity. Matching schematic linguistic labels with associated words in context adds an extra step to the noticing process, and this implies that learners become more engaged with the lexical bundles than when they simply underline them word for word, as in the context completed noticing condition. From the results in this study, it can be deduced that noticing activities that require more engagement from the learner, such as noticing

with schematic linguistic representation, can be expected to promote greater initial uptake than more passive noticing activities, such as noticing context completed lexical bundles.

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